DOCKET FILE COPY ORIGINAL

ORIGINAL

RECEIVED

MAR 15 1994

FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF THE SECRETARY

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of	)	
	)	
Amendment of Part 90 of the	)	PR Docket No. 93-61
Commission's Rules to Adopt	)	
Regulations for Automatic	)	RM No. 8013
Vehicle Monitoring Systems	)	

TO: The Commission

COMMENTS OF MARK IV IVHS DIVISION

George Y. Wheeler
Koteen & Naftalin
1150 Connecticut Avenue, N. W.
Suite 1000
Washington, D. C. 20036
(202) 467-5700

Its Counsel

No. of Copies rec'd 0+2
List ABCDE

March 15, 1994

TABLE OF CONTENTS

SUMMARY

Mark IV Industries, Ltd. I.V.H.S. Division supports adoption of a flexible frequency plan and technical regulations to provide opportunities for deployment of short-range AVI/VRC technologies including those operating with 6 MHz of continuous bandwidth. We oppose exclusive licensing of AVM spectrum because it does not address adequately the complex and interdependent spectrum needs of the numerous technologies, emissions, power levels and coverage requirements of systems currently operated in the band and the legitimate expectations of future system operators for expanded spectrum use. We also oppose the proposals of Southwestern Bell and Mobilevision to expand the primary uses of AVM spectrum to include Commercial Mobile Radio Service offerings. The focus of these proceedings should be to adopt permanent regulations establishing a block of spectrum for AVM technologies like those of Mark IV, Hughes and others to provide the unique and highly specialized functions envisaged by Congress to provide technology solutions to improve our national transportation system.

DOCKET FILE COPY ORIGINAL

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of	)	
	)	
Amendment of Part 90 of the	)	PR Docket No. 93-61
Commission's Rules to Adopt	)	
Regulations for Automatic	)	RM No. 8013
Vehicle Monitoring Systems	)	

TO: The Commission

COMMENTS OF
MARK IV INDUSTRIES, LTD., I.V.H.S. DIVISION

Mark IV Industries, Ltd., I.V.H.S. Division ("Mark IV") herewith, by its attorneys, files it comments in response to the Commission's Public Notice (DA 94-129) released February 9, 1994, with respect to ex parte presentations by PacTel Teletrac ("Teletrac"), Southwestern Bell Mobile Systems, Inc. ("Southwestern Bell") and Mobilevision ("Mobilevision") in the above-captioned proceeding.

INTRODUCTION

Mark IV has previously filed comments and reply comments dated June 29, 1993, and July 29, 1993, in the above-captioned proceeding, its Opposition dated June 9, 1993, to grant of the Application for Review and Petition for Stay of Teletrac in related proceedings,[1] and its Opposition dated May 21, 1993, to the

[1] Application of Orlando-Orange County Expressway Authorities (File No. 345273; call sign WPCA200).

Application for Freeze of application processing of AVM applications filed by Teletrac. Our comments here address aspects of our recommendations, particularly those in our previous Reply Comments in this proceeding which relate to the proposals of Teletrac and Southwestern Bell.

Mark IV, Hughes, AT&T and many others have previously described on the record here that both short-range systems for highly localized vehicle-to-roadside communications ("AVI/VRC") and long-range location systems like those of Teletrac, Southwestern Bell and Mobilevision ("AVL") will need to share the 902-928 MHz band. Accommodating such shared use is complicated because ISM and government systems as well as Part 15 non-licensed systems and amateur radio operations also have legitimate needs for access to this spectrum (and in the case of ISM and government systems established rights of priority over other frequency uses).

The AVI/VRC systems of Mark IV, Hughes and AT&T which are designed to use continuous bandwidth of 6 MHz are highly spectrum efficient and adaptable to meet IVHS needs in each of the five functional areas listed by Mobilevision.[2] For example, the efficiency of these broadband short range vehicle-roadside communications systems enables them to handle any number of traffic lanes and vehicles at a toll plaza in an electronic toll collection application with only 6 MHz of continuous bandwidth. The deployment of the short-range AVI/VRC systems manufactured by these companies has already occurred in many states and is expanding. Some of these projects include:

---

[2] Letter of Mobilevision dated February 1, 1994, pp. 2-3.

The Orlando-Orange County Expressway Authority, Florida.

The Transportation Corridor Agencies, Orange County, in California.

Grant Oliver Corporation operating landside systems for the Greater Pittsburgh Airport, Pennsylvania.

The Heavy Vehicle Electronic License Plate (HELP) program including installations in 126 lanes at 33 sites in 8 western states mainly along the Interstate 10 and Interstate 5 corridors.

The I-75 Mainline sorting project in six states along the Interstate 75 corridor.

The deployment of Mark IV and Hughes 6 MHz technologies in existing and planned systems is significant here not just because it represents a substantial imbedded technology base which the Commission's frequency plan for AVM spectrum should accommodate. These two companies have also been industry leaders promoting interoperability between their AVI/VRC product lines resulting in expanded utilization of their products, added user convenience, increased speed and economies of deployment and healthy competition among equipment suppliers. These efforts recently culminated in a memorandum of understanding described in the attached News Release dated February 14, 1994, in which the companies agreed to develop jointly 6 MHz AVI/VRC technologies "bridging" their separate AVI/VRC product lines.[3] These promising developments reverse long-standing barriers to effective deployment of new technologies for IVHS uses occurring because the equipment of different manufacturers has heretofore been incompatible.

---

[3] See the attached News Release of March IV dated February 14, 1994.

By adopting a flexible frequency plan which provides reasonable and fair opportunities for Mark IV and Hughes 6 MHz technologies, the Commission will assist ongoing efforts within the IVHS industry towards standards selection. We referenced in our previous Reply Comments the current efforts of the USDOT (FHWA), to develop a national standard focused on the Commercial Vehicle Operations ("CVO") applications. We believe that in this area standards will be established for CVO operations which will likely be compatible with the 6 MHz technologies widely deployed on the HELP and I-75 systems. Furthermore, there has been significant international coordination of CVO standards to ensure compatibility with cross border traffic into Canada, where corresponding installations will be harmonized and compatible with the U.S. corridors. The FCC should not preempt this standard development/international coordination process by adopting restrictive frequency plans in this proceeding which limit or impair the development of spectrum efficient technologies like those of Mark IV and Hughes.

RECOMMENDATIONS

We recommend here, consistent with our prior filings, that the Commission adopt permanent rules for the competitive deployment of short-range AVI/VRC systems as well as long-range AVL systems to promote spectrum efficient operations, technology development, new and innovative service offerings, cost-effective facilities/services and widespread availability IVHS functionalities. These permanent rules must be flexible. We strongly

support the needs of public service users such as The Interagency Group members to receive co-primary status vis-a-vis "other licensed users of Part 90 frequencies" to protect their IVHS facilities from displacement or interruption.[4] We also support The Interagency Group's related request for blanket-licensing of multi-jurisdictional or regional ETTM and other public service IVHS systems. The needs of these licensees should be given special consideration in these proceedings because of the widespread public benefits from the operations of such systems in promoting highway and vehicle safety, reducing roadway congestion, enhancing economic productivity and increasing energy efficient transportation.

We address here the following specific aspects of the Teletrac, Southwestern Bell and Mobilevision submissions as they relate to: (1) assuring access of short-range AVI/VRC systems to the 912-918 MHz band; (2) extending co-primary status to ETTM and other public service licensees of short-range AVI/VRC systems in the 904-912 MHz and 918-926 MHz bands; and (3) requiring that "commercial mobile radio service" offerings[5] of voice and data communications, including the "functional equivalents" of such offerings, be secondary to all Private Mobile Radio Service offerings under the Commission's permanent AVL/AVI/VRC rules.

---

[4] Interagency Group Comments, pp. 11-12.

[5] Reference is made to the recent Commission decision to classify AVM as presumptively a "private mobile radio service." See the Commission's Second Report and Order regarding Regulatory Treatment of Mobile Services in GN Docket No. 93-252 released March 7, 1994, Par. 99.

DISCUSSION

1. Mark IV Supports Expanded Access for AVI/VRC Systems to the 912-918 MHz Band.

We and numerous parties including Lockheed, IVHS America, Hughes, MFS/TI, AMTECH, Pinpoint, InterAgency Group and CALTRANS support adoption of allocations for short-range AVI/VRC deployment in the 912-918 MHz band. The Teletrac proposal by restricting its long-range AVL allocations to the 902-912 MHz and 924.89-925.39 MHz bands appears to recognize the need of AVI/VRC to allocate sufficient (i.e. at least 6 MHz) of continuous bandwidth to short-range AVI/VRC services while Southwestern Bell's proposal does not. Southwestern Bell would give primacy to AVL service providers at the expense of AVI/VRC service providers. Pending the review of further technical information on what Teletrac is proposing, we are encouraged by their recognition of the need to accommodate the bandwidth needs of AVI/VRC service providers.

The reasons of Southwestern Bell for proposing its plan to exclude AVI/VRC systems requiring 6 MHz of continuous bandwidth are not explained. Its February 2, 1994 filing and its February 7, 1994 filing do not address on their terms the impact of its proposals upon short-range AVI/VRC deployment in the 912-918 MHz band. If such matters were discussed with the FCC staff, we strongly object to the consideration of the Southwestern Bell proposal based upon the abbreviated record of those discussions in the record of this proceeding. If its reasons were not discussed with the FCC staff, it is imperative that we be given adequate

opportunity to respond to Southwestern Bell at such time as it chooses to explain this basis for its proposal.

2. The Proposal of The InterAgency Group to Assign Co-primary Status to Short-Range AVI/VRC Operations in the 904-912 MHz and 918-926 MHz Bands Should be Adopted.

We continue to support adoption of licensing policies which protect the special needs of public service users such as The InterAgency Group members by giving them co-primary status vis-a-vis other licensed users of Part 90 frequencies to protect their short-range AVI/VRC systems from displacement or interruption.[6] While we believe that such short-range systems will routinely be licensed in the 912-918 MHz band (and thus be separated from long-range AVL operations in other parts of the 902-928 MHz band), there could be occasions when circumstances require short-range AVI/VRC systems to be deployed outside the 912-918 MHz band.

The Teletrac proposal, as briefly described in its January 26 letter, possibly provides additional spectrum options for AVI/VRC operations in the 918-924 MHz band but may not permit co-channel shared uses in the 904-912 MHz band between AVL and AVI/VRC operations. This aspect of its proposals requires additional analysis when adequate information is available to examine interference factors in terms of the specific technologies to be deployed by Teletrac. We reserve comment on this point until additional information is available.

---

[6] See Footnote 4.

As discussed above in Section 1 of these comments, we strongly object to the frequency plan proposed by Southwestern Bell. Fragmentation for the bandwidth available for short-range AVI/VRC systems into three separate subbands none of which is greater than 4 MHz ignores established and proposed technology deployment by numerous manufacturers of IVHS system components requiring 6 MHz of continuous bandwidth which is already amply documented in the record. Based on the Virginia Tech Interim Report submitted with the February 2, 1994 letter of Southwestern Bell, co-channel sharing with short-range AVI/VRC systems was simply not addressed. Here as above, we reserve comment until adequate information is provided by Southwestern Bell to analyze the potential for spectrum sharing between its proposed long-range AVL technologies and the short-range AVI/VRC technologies of Mark IV and others.

3. Commercial Mobile Radio Service Uses of AVL/AVI/VRC Spectrum, Including Any Functional Equivalent, Should be Secondary to Co-primary Private Mobile Radio Service Uses.

We have previously opposed the efforts of Southwestern Bell and others to expand the permissible uses of AVL/AVI/VRC spectrum beyond non-voice signalling and ancillary status/instructional messages related to mobile/portable units involved, as originally proposed in the Commission's NPRM (i.e. draft Section 90.7). The Commission has allocated cellular, SMR (including ESMR), 220-222 MHz, broadband and narrowband PCS, all of which can be used for voice, data and other communications. Insofar as there are unmet needs for "commercial mobile radio services" ("CMRS") or the "functional equivalents" of such services, there is ample spectrum

to meet such needs using any of these technologies and additional capacity potentially available through Part 90 spectrum "refarming" and the digitization of other mobile communications systems.

We agree with the Commission that AVL/AVI/VRC should be presumptively considered Private Mobile Radio Services ("PMRS").[7] We also believe that the complex interdependence of frequency uses in the 902-928 Mhz band combined with the fact that numerous technologies, emissions, power levels, and coverage requirements all currently have incumbency rights in the band and legitimate expectations for expanded spectrum use should preclude any type of "exclusive" licensing. As discussed above, we support a co-primary status for long-range AVL and short-range AVI where necessary to implement needed public services as proposed by The InterAgency Group.

The Commission's presumption that AVL/AVI/VRC systems will be used for PMRS leads us to conclude in the unique circumstances of the 902-928 MHz band that CMRS offerings should be secondary to conflicting PMRS offerings. Logically and from a broad public policy perspective, public agencies such as those in The InterAgency Group should not be precluded from implementing advanced IVHS technologies because another co-channel licensee, such as Southwestern Bell or Mobilevison, would like to provide a conflicting CMRS offering. As discussed above, there is much alternative spectrum available for such CMRS offerings in other bands. The focus of these proceedings should be to establish a

---

[7] See Footnote 5.

viable block of spectrum for AVM technologies like those of Mark IV, Hughes and others to be deployed to provide the unique and highly specialized functions which Congress has identified as crucial to the development of new technology solutions to improve our national transportation system.[8]

CONCLUSION

Mark IV and other manufacturers of short-range AVI/VRC systems have described the ongoing deployment of systems to meet IVHS needs using high data rate active and semi-active technology with time multiplexing. With such technologies already being widely deployed, we believe the channel plan for operation of AVL/AVI/VRC systems in the 902-928 MHz bandwidth must recognize their prevalent use and provide continuous spectrum of at least 6 MHz for their deployment. In addition, we support the position of The InterAgency Group that co-primary status should be granted to ETTM and public sector licensees vis-a-vis AVL licensees so that adequate amounts of spectrum for deployment of their systems will be available.

The Teletrac proposals appear to recognize the spectrum needs for expanded short-range AVI/VRC operations of technologies such as those of Mark IV and warrant further study. It is less clear whether the Teletrac proposal adequately addresses the concerns of

---

[8] See Intermodal Surface Transportation Efficiency Act of 1991 and the Intelligent Vehicle Highway System Act of 1991.

The InterAgency Group. Based on what we know of the Southwestern Bell proposal, it should be denied.

Respectfully submitted,

MARK IV INDUSTRIES, LTD.,
I.V.H.S. DIVISION

By _____
George Y. Wheeler

KOTEEN & NAFTALIN
1150 Connecticut Avenue, N.W.
Suite 1000
Washington, D. C. 20036

Its Attorneys

March 15, 1994

NEWS RELEASE

HUGHES AND MARK IV COMBINE VEHICLE-TO-ROADSIDE COMMUNICATIONS TECHNOLOGIES FOR IVHS APPLICATIONS

FULLERTON, Calif., Feb. 14, 1994 Units of Hughes Aircraft Company and Mark IV Industries, Ltd. have signed a memorandum of understanding to jointly improve a vehicle-to-roadside communications system that is targeted for use in the Intelligent Vehicle Highway Systems technology area.

Hughes Transportation Management Systems and the IVHS Division of Mark IV Industries will provide a logical upgrade path to Mark IV's technology, which is currently being evaluated by the Interagency Group (IAG), a seven-member group of toll agencies in New York, New Jersey, and Pennsylvania. Hughes and Mark IV are currently providing vehicle-to-roadside communications systems with both commercial vehicle operations (CVO) and electronic toll and traffic management (ETTM) applications throughout North America.

Mark IV will propose a vehicle-to-roadside communications (VRC) system which will provide for a wide range of commercial, safety and utility applications, including open-road toll collection, which does not require vehicles to reduce speed or stay within a lane, as well as automatic toll collection in existing facilities.

Mark IV's current proposal is for active electronic toll collection technology, rather than passive or "backscatter" electronic toll collection technology. Active technology provides increased reliability and accuracy as well as longer range interchange of toll data.

The upgraded technology will include the Hughes VRC time division multiple access (TDMA) protocol capable of two-way communications with more than 150 vehicles concurrently. This non-proprietary, open protocol is currently under consideration by the American Society for Testing and Measurement as the national VRC standard.

Hughes is a unit of GM Hughes Electronics. The earnings of GM Hughes Electronics Corporation, a wholly owned subsidiary of General Motors Corporation, are used to calculate the earnings per share of General Motors Class H Common Stock (NYSE:GMH).

Mark IV Industries, Inc. headquartered in the Buffalo suburb of Amherst, New York manufactures products and systems for power conversion and fluid transfer; mass transit and traffic control; and the professional audio markets.

CERTIFICATE OF SERVICE

I, Judy Cooper, a secretary in the law firm of Koteen & Naftalin, do hereby certify that a copy of the foregoing "Comments of Mark IV IVHS Division" was sent by first class U.S. mail, postage prepaid, on this 15th day of March, 1994, to the following:

Edwin N. Lavergne
Ginsburg, Feldman and Bress, Chartered
1250 Connecticut Avenue, NW
Washington, DC 20036
Counsel for The Alarm Device Manufacturing Company, a division of Pittway Corporation

David R. Wiedman
Vice President Sales & Marketing
AccuScan
P.O. Box 80037
1540 Highway 138
Conyers, GA 30208-8037

Jeffrey L. Ritter
Amateur Call N5VAV
6959 Hovenkamp
Ft. Worth, TX 76118

James S. Marston
Senior Vice President and Chief Information Officer
American President Companies, Ltd.
1111 Broadway
Oakland, CA 94607

Dwight B. Hill
American Radio Relay League
165 Norcrest Drive
Rochester, NY 14617

Kenneth E. Siegel
Deputy General Counsel
American Trucking Association
2200 Mill Road
Alexandria, VA 22314

Michael J. Holliday
American Telephone and Telegraph Company
Room 3244J1
295 North Maple Avenue
Basking Ridge, NJ 07920

Richard E. Wiley ("AMTECH")
Wiley, Rein & Fielding
1776 K Street, N.W.
Washington, D.C. 20006
Counsel for AMTECH Corporation

Thomas J. Keller
Verner, Liipfert, Bernhard,
McPherson and Hand, Chartered
901 15th Street, N.W.
Suite 700
Washington, D.C. 20005
Counsel for Association of
American Railroads

Frank Dorrance
Chairman
Automatic Identification
Manufacturers Association
634 Alpha Drive
Pittsburgh, PA 15238-2802

Mark McBee
Burbank Glendale Pasadena
Airport Authority
2627 Hollywood Way
Burbank, CA 91501

Guy S. Kirchhoff
Hardware Engineering Manager
CliniCom
4720 Walnut Street
Suite 106
Boulder, CO 80301-2557

Lawrence J. Movshin
Wilkinson, Barker, Knauer &
Quinn
1735 New York Avenue, N.W.
Washington, D.C. 20006
Counsel for Consolidated
Clients

David M. LeVan
Senior Vice President
Corporate Systems
Consolidated Rail Corporation
Six Penn Center Plaza
Philadelphia, PA 19103-2959

Barbara N. McLennan
Staff Vice President
Government and Legal Affairs
Consumer Electronics Group
Electronic Industries Assn.
2001 Pennsylvania Avenue, NW
Washington, DC 20006

Robert B. Fougner
General Counsel
Cylink Corporation
310 North Mary Avenue
Sunnyvale, CA 94086

Lawrence J. Movshin
Wilkinson, Barker, Knauer &
Quinn
1735 New York Avenue, NW
Washington, DC 20006
Counsel for Domestic
Automation
Company

Joseph A. Godles
Goldberg, Godles, Wiener
& Wright
1229 19th Street, N.W.
Washington, D.C. 20036
Counsel for EnScan

David C. Jatlow
Young & Jatlow
2300 N Street, NW
Suite 600
Washington, DC 20037
Counsel for The Ericsson
Corporation

Hunter O. Wagner, Jr.
General Manager
Greater New Orleans Expressway
Commission
P.O. Box 7656
Metairie, LA 70010

Gary M. Epstein
Latham & Watkins
1001 Pennsylvania Avenue, N.W.
Washington, D.C. 20004
Counsel for Hughes Aircraft
Company

Donald L. Schilling
Executive Vice President
InterDigital Communications Corporation
833 Northern Boulevard
Great Neck, NY 11021

Neil D. Schuster
Executive Director
International Bridge, Tunnel and Turnpike Association
2120 L Street, N.W., Suite 305
Washington, D.C. 20037

Lawrence J. Movshin
Wilkinson, barker, Knauer & Quinn
1735 New York Avenue, NW
Washington, DC 20006
Counsel for Knogo Corporation, Vtech Communications and HTS

Lyndee Wells, Esq.
Winthrop, Stimson, Putnam & Roberts
1133 Connecticut Avenue, N.W.
Washington, D.C. 20036
Counsel for Location Services

Henry M. Rivera
Ginsburg, Feldman & Bress, Chartered
1250 Connecticut Avenue, N.W.
Washington, D.C. 20036
Counsel for Metricom, Inc.

Marnie K. Sarver
Reed Smith Shaw & McClay
1200 18th Street, N.W.
Washington, D.C. 20036
Counsel for Mobilevision

Allan Adler
Cohn and Marks
1333 New Hampshire Avenue
Suite 600
Washington, DC 20036-1573
Counsel for The Interagency Group (i.e., the New Jersey Highway Authority, the New York State Thruway Authority, the Pennsylvania Turnpike Commission, the Port Authority of New York and New Jersey, the South Jersey Transportation Authority, and the Triborough Bridge and Tunnel Authority)

Ronald F. Cunningham
Vice President
Transportation Systems and Services
Lockheed IMS
Glenpointe Centre East
Teaneck, NJ 07666

David E. Weisman
Meyer, Faller, Weisman, and Rosenberg, P.C.
4400 Jenifer Street, NW
Suite 380
Washington, DC 20015
Counsel for National Association of Business and Educational Radio, Inc. (NABER)

David Schlotterbeck
Executive Vice President/Chief Operating Officer
Nellcor Incorporated
25495 Whitesell Street
Hayward, CA 94545

Stephen R. Bell
Squire, Sanders & Dempsey
1201 Pennsylvania Avenue, NW
P.O. Box 407
Washington, DC 20044
Counsel for Norand Corporation

Albert H. Kramer
Keck, Mahin & Cate
1201 New York Avenue, NW
Penthouse Suite
Washington, DC 20005
Counsel for North American
Telecommunications
Association

Stanley M. Gorinson
Preston, Gates, Ellis &
Roubelas Meeds
1735 New York Avenue, NW
Suite 500
Washington, DC 20006
Counsel for North American
Teletrac
& Location Technologies, Inc.

Richard L. Ridings
Chief Executive Officer
Oklahoma Turnpike Authority
3500 Martin Luther King Avenue
P.O. Box 11357
Oklahoma City, OK 73136-0357

Charles W. Gilliard
Director of Operations
Orlando-Orange County
Expressway Authority
525 S. Magnolia Avenue
Orlando, FL 32801

John L. Bartlett
Wiley, Rein & Fielding
1776 K Street, N.W.
Washington, D.C. 20006
Counsel for Pinpoint
Communications, Inc.

Richard G. Smith
Quinn, Kully and Morrow
520 S. Grand Avenue
8th Floor
Los Angeles, CA 90071

James E. Dunstan
Haley, Bader & Potts
Suite 900
4350 North Fairfax Drive
Arlington, VA 22203-1633
Counsel for Radian Corporation

Gordon Schlesinger
Radio Communications
Coordinator,
Information Systems Department
Southern California Gas
Company
555 W. Fifth Street
Los Angeles, CA 90013-1011

Robert L. Borchardt, President
Recoton Corporation
2950 Lake Emma Road
Lake Mary, FL 32746

Robert H. Schwaninger, Jr.
Brown & Schwaningr
1835 K Street, NW
Suite 650
Washington, DC 20006
Counsel for Saab-Scania
Combitech AB
Combitech Traffic Systems

Ken Imber
Salt Lake City Authority
AAMF Box 22084
Salt Lake City, UT 84122

J. R. Beyster
Chairman & CEO
Science Applications
International Corp.
1241 Cave Street
La Jolla, CA 92037

Warren G. Lavey
Skadden, Arps, Slate,
Meagher & Glom
333 West Wacker Drive
Chicago, IL 60606
Counsel for Sensormatic
Electronics
Corporation

Henry M. Rivera
Ginsburg, Feldman & Bress,
Chartered
1250 Connecticut Avenue, N.W.
Washington, D.C. 20036
Counsel for Southern
California
Edison Company

Gordon Schlesinger
Radio Communications
Coordinator
Information Systems Department
Southern California Gas
Company
555 West Fifth Street
Los Angeles, CA 90013-1011

Louis Gurman
Gurman, Kurtis, Blask &
Freedman
Chartered
1400 16th Street, NW
Suite 500
Washington, DC 20036
Counsel for Southwestern Bell
Mobile Systems, Inc.

James D. Ellis
Southwestern Bell Corporation
One Bell Center, Room 3524
St. Louis, Missouri 63101-3099

Peter Tannenwald
Arent, Fox, Kintner,
Plotkin & Kahn
1050 Connecticut Avenue, N.W.
Washington, DC 20036-5339
Counsel for Symbol
Technologies, Inc.

Jack Taylor, Esq.
The Part 15 Coalition
9215 Rancho Drive
Elk Grove, CA 95624

Debra A. Perelman
Corporate Counsel
Telxon Corporation
3330 W. Market Street
Akron, OH 44313

Andrew Lipman
Swidler & Berlin, Chartered
3000 K Street, NW
Suite 300
Washington, DC 20007

James R. Haynes
Chief Engineer
Uniden America Corporation
Engineering Services Office
8707 North by Northeast Blvd.
Fishers, IN 46038

Jon Nelson, V.P. Engineering
Uniplex Corporation
2905 Country Drive
St. Paul, MN 55117

Thomas J. Tiderington
Group Supervisor
Southeast Florida Regional
Task Force
U.S. Department of Justice
Drug Enforcement
Administration
Ft. Lauderdale District Office
1475 W. Cypress Creek Road
Suite 301
Ft. Lauderdale, FL 33309

Joseph Cherne
Supervisor, Vehicle UPS
U.S. Postal Service
Processing and Distribution
Center
433 W. Van Buren Street
Chicago, IL 60607-9997

Jeffrey Sheldon
Utilities Telecommunications
Council
1140 Connecticut Avenue, N.W.
Suite 1140
Washington, D.C. 20036

A. Levi
Vulcan Chemicals, Inc.
6200 S. Ridge Road
Wichita, KS 67277

Judy Cooper